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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,601	12/11/2003	Robert A. Cochran	10001361-2	8202

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EXAMINER

PORTKA, GARY J

ART UNIT PAPER NUMBER

2188

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/733,601

Applicant(s)

COCHRAN, ROBERT A.

Examiner

Gary J Portka

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2 and 4-10 is/are allowed.
- 6) ☒ Claim(s) 11 and 13 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 3 and 14-17 have been canceled by Applicant. Claims 1-2 and 4-13 are pending.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeCrone, US Patent 5,529,944 B1, in view of VanderSpek, US Patent 6,477,591 B1.

4. As to claim 11, LeCrone substantially discloses the recited *storage device including primary and backup logical units together comprising a mirrored pair, and controller that receives a trigger I/O request (mirror split command) directed to the primary logical unit (directed to the mirror pair is directed to the units thereof), which initiates a mirror split operation to the pair* (see col. 7 lines 18-36, which describe a split command which stops the mirroring for any purpose, such as restore operations). LeCrone does not disclose that the trigger is queued in sequence with other I/O requests. However, it was known in mirroring operations to insert the mirroring control commands into the same queue as other I/O requests, as taught by VanderSpek at col. 7 line 65 to col. 8 line 20, and at col. 8 line 62 to col. 9 line 14. As described therein, a mirror control command is inserted into a queue, which allows read and write

commands to be asynchronously executed and the mirror control commands to be synchronously executed (and thus equivalently “dequeued”; that is, the command must be dequeued to perform the action thereof), while reducing the need for separate circuitry to implement each. An artisan would have desired this versatility in control with associated reduction in need for separate circuitry in LeCrone, and therefore would have likewise inserted the mirror split command into a queue with the I/O stream. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to insert the trigger in the I/O request stream queue, because it was known to insert mirror control commands into such queues to increase the versatility of control while reducing the need for separate circuitry.

5. As to claim 13, LeCrone teaches the alternative limitations as follows: The device controller may be seen as a “special logical unit”, any path the split command is sent on may be considered a “special path” to the extent recited, and the trigger may be considered special since it is a split command.

#### ***Allowable Subject Matter***

6. Claims 1-2 and 4-10 are allowed.

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

8. Applicant's arguments filed January 10, 2005 have been fully considered and are persuasive as applicable to claim 1 but are not persuasive as applicable to claim 11.

Art Unit: 2188

First Examiner notes that in accordance with the specification "FIG. 5B ... shows the trigger I/O request 502 ... placed in the input queue 416 as a special TRIGGER message ..." and thus the claimed I/O request is seen also as the claimed TRIGGER message when queued as described in the combination of the prior art. Applicants argue regarding consistent states, but nothing in the claims require consistent states. Applicants argue regarding a sequenced stream of I/O requests; Examiner believes that either reference must have a "sequenced stream" of I/O requests to the extent claimed, but that clearly the I/O queue of VanderSpek implements a sequenced stream, since a queue maintains a first-in first-out order for the requests. Applicants argue that VanderSpek is directed to an unrelated field of technology, but Examiner maintains that the references both pertain to the field of control of mirrored storage devices, and that an artisan would have considered their teachings related, at least as described in the rejection above. Applicant argues regarding emptying of the I/O queue and out-of-order reception problem, but these are not supported by claim language.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary J Portka whose telephone number is (521) 272-4211. The examiner can normally be reached on M-F 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (521) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Gary J Portka  
Primary Examiner  
Art Unit 2188

March 5, 2005